PG2.Cv03

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- package Mathematics
- package Modeling
- package Rendering
- package Shading

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Namespaces

- package Properties

Classes

- class Form1
- class **Program**

4.3 Package PG2.Cv03.Properties

Classes

- class **Resources**

  A strongly-typed resource class, for looking up localized strings, etc.
- class **Settings**

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Classes

- class Light

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Classes

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Classes

- class Checker
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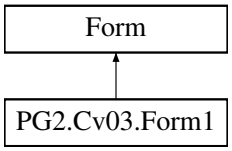
Chapter 5

Class Documentation

5.1 PG2.Cv03.Form1 Class Reference

Inheritance diagram for PG2.Cv03.Form1:



Public Member Functions

- void **InitSceneAndLights** ()

Protected Member Functions

- override void **OnPaint** (PaintEventArgs e)
- override void Dispose (bool disposing)

  Clean up any resources being used.

5.1.1 Member Function Documentation

5.1.1.1 override void PG2.Cv03.Form1.Dispose (bool *disposing*) [protected]

Clean up any resources being used.

Parameters

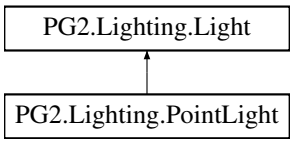
disposing	true if managed resources should be disposed; otherwise, false.

The documentation for this class was generated from the following files:

- Form1.cs
- Form1.Designer.cs

5.2 PG2.Lighting.Light Class Reference

Inheritance diagram for PG2.Lighting.Light:



Public Member Functions

- virtual Double **GetAttenuationFactor** (Vector3 point)
- virtual void **SetLightRayAt** (Vector3 point, Ray ray)

Public Attributes

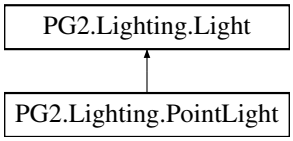
- Vector3 **Origin**
- Double **Intensity**
- Vector3 **DiffuseColor** = new Vector3(1, 1, 1)

The documentation for this class was generated from the following file:

- Lighting/Light.cs

5.3 PG2.Lighting.PointLight Class Reference

Inheritance diagram for PG2.Lighting.PointLight:



Public Member Functions

- override Double **GetAttenuationFactor** (Vector3 point)
- override void **SetLightRayAt** (Vector3 point, Ray ray)

Public Attributes

- Double **LinearAttenuation** = 0.02
- Double **QuadraticAttenuation** = 0.0

The documentation for this class was generated from the following file:

- Lighting/PointLight.cs

5.4 PG2.Mathematics.Vector3 Struct Reference

Public Member Functions

- **Vector3** (Double x, Double y, Double z)
- override String **ToString** ()

Static Public Member Functions

- static Vector3 **operator-** (Vector3 a)
- static Vector3 **operator+** (Vector3 a, Vector3 b)
- static Vector3 **operator-** (Vector3 a, Vector3 b)
- static Vector3 **operator*** (Vector3 a, Double b)
- static Vector3 **operator*** (Double a, Vector3 b)
- static Double **operator*** (Vector3 a, Vector3 b)
- static Vector3 **operator%** (Vector3 a, Vector3 b)
- static Vector3 **operator^** (Vector3 a, Vector3 b)
- static Vector3 **Clamp** (Vector3 v, Double min, Double max)

Public Attributes

- Double **X**
- Double **Y**
- Double **Z**

Properties

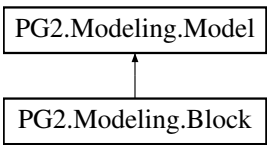
- Double **Length** `[get]`
- Vector3 **Normalized** `[get]`
- static Vector3 **Zero** `[get]`

The documentation for this struct was generated from the following file:

- Mathematics/Vector3.cs

5.5 PG2.Modeling.Block Class Reference

Inheritance diagram for PG2.Modeling.Block:



Public Member Functions

- **Block** (Shader shader, Vector3 min, Vector3 max)
- override void **Collide** (Ray ray)

Static Public Member Functions

- static void **Collide** (Ray ray, Block box)

Public Attributes

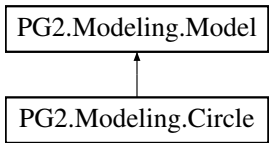
- Vector3 **Min**
- Vector3 **Max**

The documentation for this class was generated from the following file:

- Modeling/Block.cs

5.6 PG2.Modeling.Circle Class Reference

Inheritance diagram for PG2.Modeling.Circle:



Public Member Functions

- **Circle** (Shader shader, Vector3 origin, Vector3 normal, Double radius)
- override void **Collide** (Ray ray)

Static Public Member Functions

- static void **Collide** (Ray ray, Circle circle)

Public Attributes

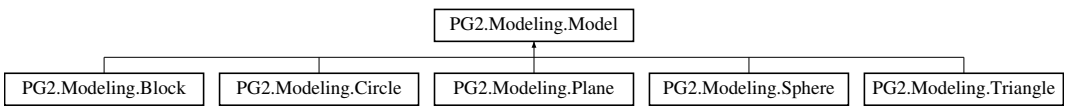
- Vector3 **Origin**
- Vector3 **Normal**
- Double **Radius**

The documentation for this class was generated from the following file:

- Modeling/Circle.cs

5.7 PG2.Modeling.Model Class Reference

Inheritance diagram for PG2.Modeling.Model:



Public Member Functions

- virtual void **Collide** (Ray ray)

Public Attributes

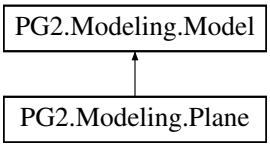
- const double **Eps** = 1e-5
- Shader **Shader**

The documentation for this class was generated from the following file:

- Modeling/Model.cs

5.8 PG2.Modeling.Plane Class Reference

Inheritance diagram for PG2.Modeling.Plane:



Public Member Functions

- **Plane** (Shader shader, Vector3 origin, Vector3 normal)
- override void **Collide** (Ray ray)

Static Public Member Functions

- static void **Collide** (Ray ray, Plane plane)

Public Attributes

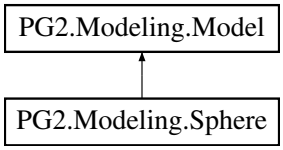
- Vector3 **Origin**
- Vector3 **Normal**

The documentation for this class was generated from the following file:

- Modeling/Plane.cs

5.9 PG2.Modeling.Sphere Class Reference

Inheritance diagram for PG2.Modeling.Sphere:



Public Member Functions

- **Sphere** (Shader shader, Vector3 origin, Double radius)
- override void **Collide** (Ray ray)

Static Public Member Functions

- static void **Collide** (Ray ray, Sphere sphere)

Public Attributes

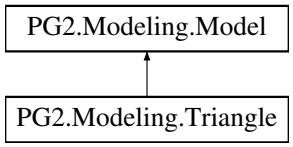
- Vector3 **Origin**
- Double **Radius**

The documentation for this class was generated from the following file:

- Modeling/Sphere.cs

5.10 PG2.Modeling.Triangle Class Reference

Inheritance diagram for PG2.Modeling.Triangle:



Public Member Functions

- **Triangle** (Shader shader, Vector3 v1, Vector3 v2, Vector3 v3)
- override void **Collide** (Ray ray)

Static Public Member Functions

- static void **Collide** (Ray ray, Triangle triangle)

Public Attributes

- Vector3 **Vertex1**
- Vector3 **Vertex2**
- Vector3 **Vertex3**

The documentation for this class was generated from the following file:

- Modeling/Triangle.cs

5.11 PG2.Modeling.World Class Reference

Public Member Functions

- void **Collide** (Ray ray)

Public Attributes

- List< Model > **Models** = new List<Model>()
- List< Light > **Lights** = new List<Light>()

The documentation for this class was generated from the following file:

- Modeling/World.cs

5.12 PG2.Rendering.Camera Class Reference

Classes

- struct HitPoint

Public Member Functions

- **Camera** (Int32 width, Int32 height)
- Vector3 **GetPixel** (Int32 i, Int32 j)
- void **SetPixel** (Int32 i, Int32 j, Vector3 color)
- void **Render** ()
- void RayTrace ()

  Derived from Computer Graphics - David Mount. Implementations can differ - make your own from scratch. See http://goo.gl/q6Sz0 *(page 84) and* http://goo.gl/rB8J6 *(page 9-10)*
- Vector3 **RayTrace** (Ray ray)
- void **PresentFrame** ()

Public Attributes

- Vector3 **Position**
- Vector3 **Target**
- Vector3 **Up** = new Vector3(0, 0, 1)
- Double **FovY** = 45
- Vector3 **U**
- Bitmap **Bitmap**
- Int32 **Width**
- Int32 **Height**
- Vector3[] **Pixels**
- Vector3 **BgColor** = new Vector3(0, 0, 0)
- World **World**
- Double **zNear**
- Double **zFar**
- Boolean **UseShadows** = true
- Boolean **UseLightAttenuation** = true

5.12.1 Member Function Documentation

5.12.1.1 void PG2.Rendering.Camera.RayTrace ( )

Derived from Computer Graphics - David Mount. Implementations can differ - make your own from scratch. See http://goo.gl/q6Sz0 (page 84) and http://goo.gl/rB8J6 (page 9-10)

The documentation for this class was generated from the following file:

- Rendering/Camera.cs

5.13 PG2.Rendering.Camera.HitPoint Struct Reference

Public Attributes

- Vector3 **Position**
- Vector3 **Color**
- Vector3 **Normal**

The documentation for this struct was generated from the following file:

- Rendering/Camera.cs

5.14 PG2.Rendering.Ray Class Reference

Public Member Functions

- **Ray** (Vector3 origin, Vector3 direction, Double zFar)
- void **Set** (Vector3 origin, Vector3 direction, Double zFar=Double.MaxValue)
- Vector3 **GetHitPoint** ()

Public Attributes

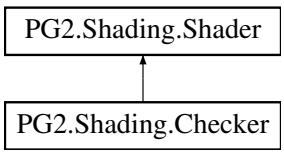
- Vector3 **Origin**
- Vector3 **Direction**
- Double **HitParameter**
- Vector3 **HitNormal**
- Model **HitModel** = null

The documentation for this class was generated from the following file:

- Rendering/Ray.cs

5.15 PG2.Shading.Checker Class Reference

Inheritance diagram for PG2.Shading.Checker:



Public Member Functions

- **Checker** (Double cubesize)
- **Checker** (Shader shader0, Shader shader1)
- **Checker** (Shader shader0, Shader shader1, Double cubesize)
- override Vector3 **GetColor** (Vector3 point, Vector3 normal, Vector3 viewDir, Vector3 lightDir, Double lightIntensity, Light light)
- override Vector3 **GetAmbientColor** (Vector3 point)

Public Attributes

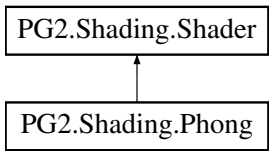
- const double **Eps** = 1e-5
- Shader **Shader0** = new Phong(new Vector3(1, 1, 1))
- Shader **Shader1** = new Phong(new Vector3(0, 0, 0))
- Double **CubeSize** = 1

The documentation for this class was generated from the following file:

- Shading/Checker.cs

5.16 PG2.Shading.Phong Class Reference

Inheritance diagram for PG2.Shading.Phong:



Public Member Functions

- **Phong** (Vector3 diffuseColor)
- **Phong** (Vector3 diffuseColor, Vector3 specularColor)
- **Phong** (Vector3 diffuseColor, Vector3 specularColor, Vector3 ambientColor)
- **Phong** (Vector3 diffuseColor, Vector3 specularColor, Vector3 ambientColor, Double shininess)
- override Vector3 **GetColor** (Vector3 point, Vector3 normal, Vector3 viewDir, Vector3 lightDir, Double attenuation, Light light)
- override Vector3 **GetAmbientColor** (Vector3 point)

Public Attributes

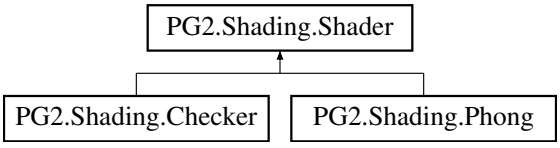
- Vector3 **DiffuseColor** = new Vector3(0, 0, 0)
- Vector3 **SpecularColor** = new Vector3(0, 0, 0)
- Vector3 **AmbientColor** = new Vector3(0, 0, 0)
- Double **Shininess** = 0

The documentation for this class was generated from the following file:

- Shading/Phong.cs

5.17 PG2.Shading.Shader Class Reference

Inheritance diagram for PG2.Shading.Shader:



Public Member Functions

- virtual Vector3 **GetColor** (Vector3 point, Vector3 normal, Vector3 viewDir, Vector3 lightDir, Double lightIntensity, Light light)
- virtual Vector3 **GetAmbientColor** (Vector3 point)

The documentation for this class was generated from the following file:

- Shading/Shader.cs